

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* YOSI BAR-EREZ

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Appeal 2006-2272  
Application 09/581,990  
Technology Center 1700

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Decided: November 16, 2006

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Before PAK, WALTZ and GAUDETTE, *Administrative Patent Judges*.  
WALTZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the Primary Examiner's final rejection of claims 26 through 45, 51, 52, 55, and 56, which are the only claims pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to Appellant, the invention is directed to a method and apparatus for making a three-dimensional object made from a large number of preformed sheets each bonded on one side to the next adjacent sheet on its

opposite side, with each sheet cut along a contour corresponding to the contour of the respective layer constituted by the sheet in the object (Br. 4-5).<sup>1</sup> Appellant's method includes the step of selectively applying a releasing agent effective to inhibit bonding between adjacent sheets, such that the remaining portion of the sheet not within the contour is readily separable from the three-dimensional object (Br. 4). Claims 26 and 36 are illustrative of the invention and are reproduced below:

26. A method of making a three-dimensional object constituted of a large number of thin preformed sheets each bonded on one side to the next adjacent sheet on its opposite side, with each sheet cut along a contour corresponding to the contour of the respective layer constituted by the sheet in the object, the method comprising selectively applying to one side of each sheet a releasing agent effective to inhibit bonding between adjacent sheets, the releasing agent being applied selectively in a manner such that, after the sheet has been bonded to the next adjacent sheet on that side, the surface of the sheet within the respective contour is bonded to the next adjacent sheet, while the remaining portion of the respective sheet not within said contour is readily separable from the three-dimensional object.

36. Apparatus for making a three-dimensional object constituted of a large number of thin preformed sheets each bonded on its opposite sides to the next adjacent sheets on its opposite sides, with each sheet cut by a cutting tool along a contour corresponding to the contour of the respective layer constituted by the sheet in the object, characterized in that said apparatus includes a releasing-agent applicator for selectively applying a coating on one side of each sheet, before being bonded to the next adjacent sheet on that side, of a releasing agent, said coating being selectively applied in a manner such that, after the respective sheet has been bonded to the next adjacent sheet on that side, the surface of the sheet within its respective contour is bonded to said next adjacent sheet, while the remaining portion of the respective sheet not within said contour may be readily separated from the three-dimensional object.

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<sup>1</sup> We refer to and cite from the "Appellant's Brief" dated Sep. 07, 2005.

The Examiner has relied upon the following references as evidence of obviousness:

Miller	US 3,827,625	Aug. 06, 1974
Belanger	US 4,721,453	Jan. 26, 1988
Berman	US 5,071,503	Dec. 10, 1991
Feygin	US 5,730,817	Mar. 24, 1998
Kinzie	US 6,136,132	Oct. 24, 2000
Richards	US 6,161,604	Dec. 19, 2000

The following grounds of rejection are reviewed in this appeal:

- (1) claims 26-29, 51, and 55 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Feygin in view of Kinzie (Answer 3); and
- (2) claims 30, 35-41, 43, and 56 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Feygin in view of Kinzie and Belanger (Answer 5 and 7).<sup>2</sup>

Based on the totality of the record, we affirm all grounds of rejection in this appeal essentially for the reasons stated in the Answer, as well as those reasons set forth below.

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<sup>2</sup> Claim 55 was inadvertently omitted by the Examiner from the rejection of claims 26-29 and 51 under § 103(a) over Feygin in view of Kinzie, as was claim 56 omitted from the rejection of claims 36-41, and 43 under § 103(a) over Feygin in view of Kinzie and Belanger (see the Final Office Action dated May 5, 2004, pages 2 and 5; Answer 3 and 7). We hold this error harmless as Appellant only argues claim 26 with any specificity in the Brief (see the Brief in its entirety). Furthermore, Appellant only requests that two grounds of rejection be reviewed on appeal (while eight rejections were presented in the Final Office Action dated May 5, 2004; Br. 5). Although these “grounds of rejection” listed in the Brief include claims that were not rejected over the listed references, we nevertheless consider all rejections involving the listed references, but limit our review to the consideration of claim 26 (and claim 36 to which the arguments for claim 26 above “apply equally”; Br. 12).

## OPINION

The Examiner finds that Feygin discloses a method of making a three-dimensional object formed from a plurality of thin preformed sheets each bonded on one side to the next adjacent sheet, with each sheet cut along a contour corresponding to the contour of the respective layer constituted by the sheet in the object, where one side of a sheet is bonded to the opposite side of an adjacent sheet such that the remaining portion of the sheet not within the contour is readily separable from the three-dimensional object (Answer 3).

The Examiner recognizes that Feygin does not disclose the selective deployment of a releasing agent on one side of the sheet (Answer 4). The Examiner finds that one of ordinary skill in this art would have recognized the advantage of preventing the waste material from undesirably adhering to the sheets forming the three-dimensional object and used the teachings of Kinzie, who forms a three-dimensional object where a release coating is selectively applied to prevent undesired adhesion (*id.*). From these findings, the Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Feygin to include selectively coating the top side of each sheet with a releasing agent as taught by Kinzie to prevent undesired adhesion of the portion of the sheet comprising waste material to the portion of the sheet comprising a layer of the three-dimensional object (*id.*). We agree.

Appellant argues that Feygin does not suggest that selective non-adhesion would be advantageous (Br. 8). Appellant further argues that Feygin has no need for a selective bonding technique since this reference teaches an alternative technique for facilitating detachment of residue

material, namely, cross-hatching (Br. 8-9). Therefore Appellant argues that one ordinarily skilled in the art would have no motivation to seek an alternative solution as suggested by the Examiner (Br. 9).

Appellant's arguments are not persuasive. As correctly found by the Examiner (Answer 11-12), Feygin does not disclose a method which uses selective non-adhesion but the reference is also not limited to cross-hatching as a method of removing waste or residual material. Specifically, Feygin teaches that "the material outside of the [contour] line **80** is typically scrap, and is removed in various methods." (Feygin 5: 56-58). Feygin further teaches that "*one method* of removing unwanted material . . . [is] cross-hatching **82**" (Feygin 5:60-62, italics added). Finally, Feygin teaches that "other methods of removing the unwanted material outside of the cut line **80** are possible, such as those described in U.S. Pat. Nos. 4,752,352 and 5,354,414." (Feygin 5:67-6:2). These "other methods" refer to, *inter alia*, U.S. Patent No. 5,354,414 to Feygin (hereafter Feygin '414), which is also discussed in Kinzie (1:55-67). Kinzie discloses a problem with the methods of Feygin '414 and others in the prior art, namely leaving the excess material in place for structural support in thin layer lamination "increases the need for selective bonding, to facilitate detachment of the excess material." (Kinzie 3:5-12). Kinzie teaches that in some cases "it may be appropriate to selectively apply a bond inhibitor, such as a protective layer or a release agent" closely coordinated with the lamination-press step (Kinzie 12: 4-9). Accordingly, we agree with the Examiner that one of ordinary skill in this art would have been motivated to selectively apply a releasing agent to the unwanted material outside of the cut line of Feygin, as taught by Kinzie, to facilitate removal or separation of this material. *See In re Fout*, 675 F.2d

297, 301, 213 USPQ 532, 536 (CCPA 1982)(“Express suggestion to substitute one equivalent for another need not be present to render such substitution obvious. [Citation omitted].”).

Appellant argues that the bonding Kinzie refers to is the attachment of thick, rigid elements (Br. 9). Thus Appellant argues that the design considerations for attachment techniques are markedly different from those of thin-sheet stack construction such as disclosed by Feygin (*id.*).

These arguments are not well taken. As previously discussed, Kinzie teaches the “increasing need” for selective bonding when using laminated layers that are “thin” (Kinzie 3:5-12). Furthermore, it has been established that Feygin teaches that other methods of removal of unwanted material can be found in Feygin ‘414, which reference is also discussed by Kinzie (Kinzie 1:55-67). Accordingly, the “design considerations” referred to by Appellant would have been similar for all of the cited and applied prior art in the construction of laminated three-dimensional objects.

Appellant argues that any application of a releasing agent in Feygin would disrupt the binding between adjacent layers of the cross-hatched residue material around the object, therefore rendering the prior art invention unsatisfactory for its intended purpose (Br. 9).

This argument is also not well taken. As correctly noted by the Examiner (Answer 13), the proposed modification of Feygin would employ a releasing agent to selectively promote non-adhesion in lieu of employing the exemplified method of removing unwanted material, i.e., cross-hatching. The Examiner’s proposed modification never suggested using both methods to remove unwanted material.

Appellant argues that the combination suggested by the Examiner “lacks a reasonable expectation of success” in view of the highly undesirable results discussed above and the use of a general coating of a volatile solvent as suggested by Kinzie (Br. 11).

This argument is also not persuasive. As discussed above, using an equivalent or suggested alternative method of removal of unwanted material would have established a “reasonable expectation of success.” The “highly undesirable” results would not occur since, as also discussed above, the use of both a releasing agent and cross-hatching has not been suggested or proposed. Similarly, the use of both cross-hatching and the general coating of a volatile solvent has not been suggested or proposed.

The Examiner has additionally relied upon Belanger only for the disclosure of conventional means for applying a release agent (Answer 5, 8, and 15-16). Appellant argues that the method and context of Belanger differs from the claimed method and problem solved by the invention (Br. 13). Appellant further argues that the applicator (sprayer) of Belanger is unsuited for use in combination with Feygin (*id.*).

These arguments are not persuasive. Appellant has not disputed the Examiner’s finding that Belanger discloses conventional means for applying a releasing agent. The method of Belanger is not an issue in this rejection and Appellant has not provided any evidence or reasoning supporting the contention that the applicator of Belanger is “unsuited” for use in Feygin, especially in view of the Examiner’s finding that Kinzie discloses similar applicators for applying the adhesive bonding material (Answer 14).

For the foregoing reasons and those presented in the Answer, we determine that the Examiner has established a *prima facie* case of

obviousness in view of the reference evidence. Based on the totality of the record, including due consideration of Appellant's arguments, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of § 103(a). Therefore we affirm all rejections on appeal.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

**AFFIRMED**

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